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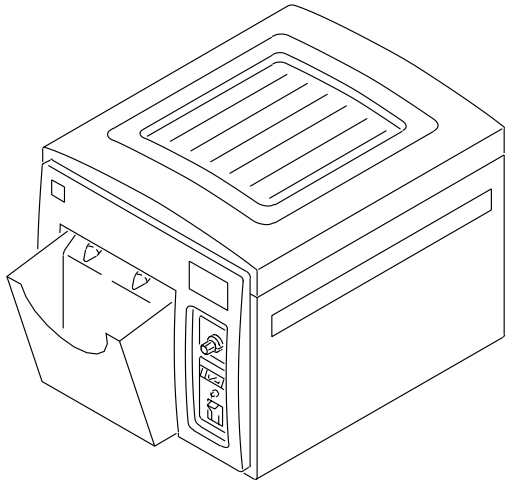
HEALTH IMAGING

OPERATOR MANUAL
for the
Kodak Min-R MAMMOGRAPHY PROCESSOR



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Warning

To avoid hazardous conditions, keep floors and floor coverings around your Processor and associated drains clean and dry at all times. Any accumulation of fluids from mixing tanks, drain lines, etc., should be cleaned up immediately. In the event of an accumulation of liquid due to backup, overflow, or other malfunctions of the drain associated with your Processor, call a plumber or other contractor to correct any problem with the drain. Kodak accepts no responsibility or liability whatsoever for the serviceability of any drain connected to or associated with a Processor. Such drains are the sole responsibility of the customer.

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Section 1: Safety

Chemical Hazard

Warning

Gloves and protective eyewear must be worn when working with chemistry, especially fixer solutions. If chemicals get into the eyes, flush them thoroughly with large volumes of water. If irritation persists, see a doctor.

Besides being a potential cause of falls, the chemistry can contaminate waste water and irritate the skin and eyes. Chemistry spills must be cleaned up immediately. You must:

- prevent the spilled chemistry from entering a waste water drain.
- clean up the spill with a moist mop or rag.
- dispose of cleaning materials and waste water collected during the cleanup according to environment regulations.
- ensure that the air exhaust pipe is always connected to a ventilation system, because inhalation of chemicals is dangerous to health and should be avoided.
- observe all environmental regulation for storage and disposal of waste chemicals.
- use these instructions in conjunction with the chemical instructions.

Operator Precaution

Warning

The operator must:

- **only** be allowed to remove the Top Cover to avoid electrical and mechanical hazard.
- not exchange any internal parts.
- call service personnel to perform any repairs.
- not operate equipment with a damaged power cord.
- not use an extension cord to power this equipment.
- position the power cord so it will not be tripped over or pulled.

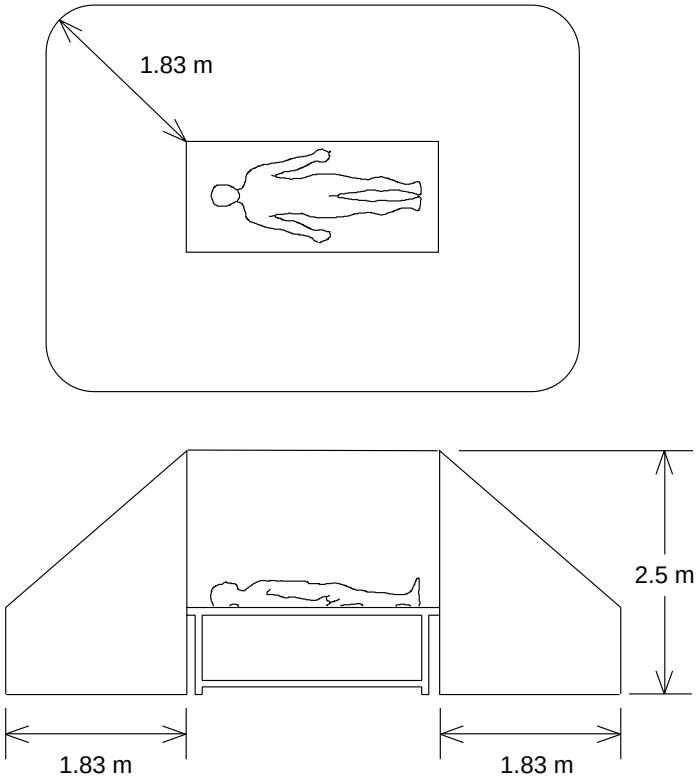
Equipment Damage

Caution

The equipment is not contained in a sealed cabinet. Therefore, it must not be used in locations where it can come in contact with liquids, including bodily fluids.

This equipment generates, uses, and can radiate radio frequency energy. If not installed by qualified service personnel and used in accordance with the User Guide, may cause interference to radio communications and other electronic devices. Operation of this equipment in a residential area may cause interference, in which case the user, at their own expense, will be required to take whatever measures may be required to correct the interference.

Nonpatient Contact Equipment



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Warning

This device is not medical equipment according to EN 60 601-1 and must not enter the patient environment as defined by EN 60 601-1. The following requirements have to be met:

- Distance from the device to Nonpatient Contact Equipment:

  Horizontal = 1.83 meters

  Vertical = 2.5 meters above the floor under the patient
- Contact of the patient and the device simultaneously by the caregiver is not allowed.
- No direct electrical connection is allowed between the device and the Nonpatient Contact Equipment.

Section 2: Overview

The Processor is designed to process medical x-ray sheet film that can be processed in the **Kodak** RP *X-Omat* Developer and Replenisher, the *Kodak* RP *X-Omat* Fixer and Replenisher, and the *Kodak* RP *X-Omat* EX Developer and Replenisher.

The self-threading roller transport system has:

- a film-length detection system
- a replenishment system
- a developer solution filter
- a recirculation system for the developer and fixer solutions
- an automatic standby feature

The Processor can operate at 2 different transport speed cycles:

- Standard Cycle has a transport speed of 76.2 ± 1.5 cm (30.4 ± 0.6 in.) per minute or 157 ± 5 seconds drop time, dry to dry, for a 43 cm (17 in.) sheet of film. The developer temperature is 33.3 ± 0.3°C (92.0 ± 0.5°F).
- Rapid Cycle has a transport speed of 101.6 ±± 2.0 cm (40.0 ± 0.8 in.) per minute or 118 ± 4 seconds drop time, dry to dry, for a 43 cm (17 in.) sheet of film. The developer temperature is 34.4 ±± 0.3°C (94.0 ± 0.5°F).

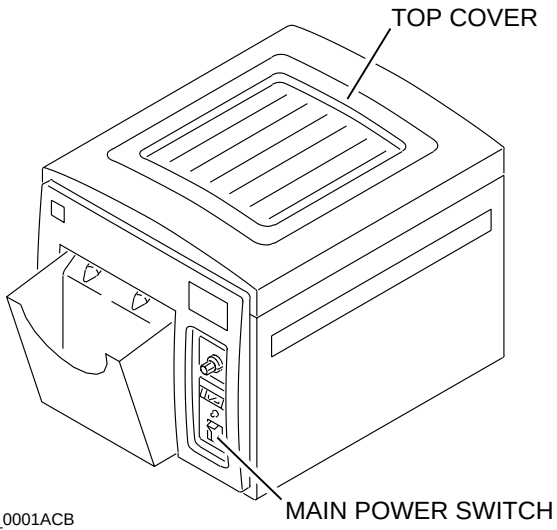
Note

The transport speed and the developer solution filter can only be changed by qualified service personnel.

A film feed signal sounds 3 seconds after the film being processed has cleared the Rollers of the Detector Crossover Assembly. This indicates that the Processor is ready to accept another piece of film.

Section 3: Processing Film

Start Up



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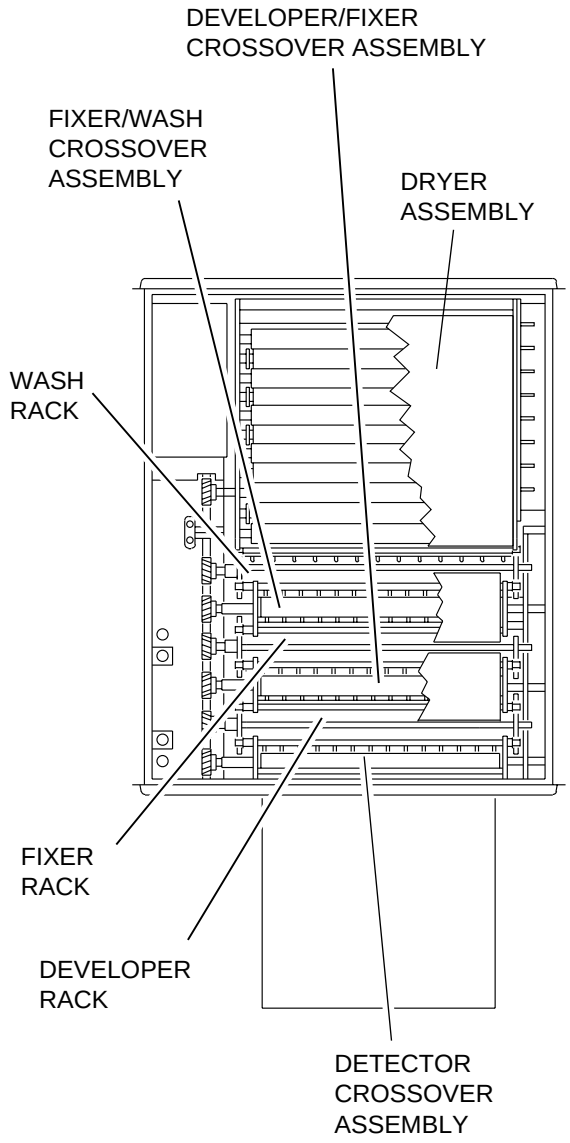
[1] Check that the Processor is off.

[2] Remove the Top Cover.



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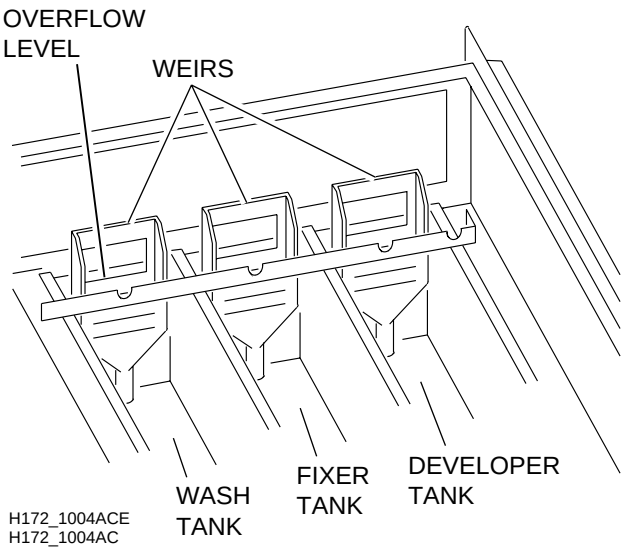
[3] Check that the following are seated correctly:

- Developer Rack
- Fixer Rack
- Wash Rack
- Fixer/Wash Crossover Assembly
- Developer/Fixer Crossover Assembly
- Detector Crossover Assembly
- Dryer Assembly



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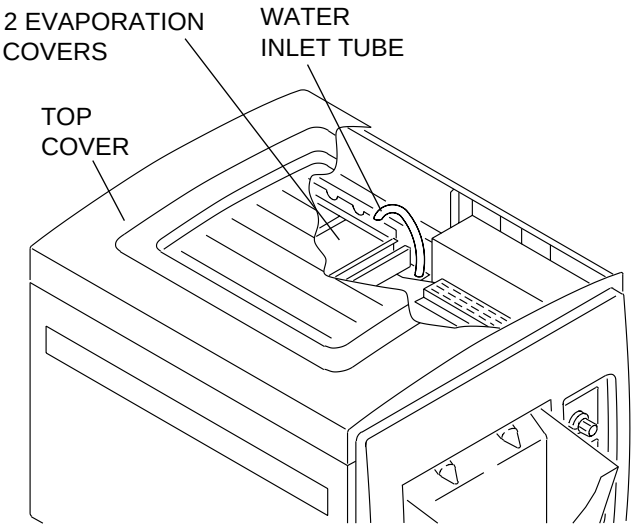
[4] Check that the solutions in the Developer, Fixer, and Wash Tanks are at the Overflow Level.

[5] Turn on the water supply.



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[6] Check:

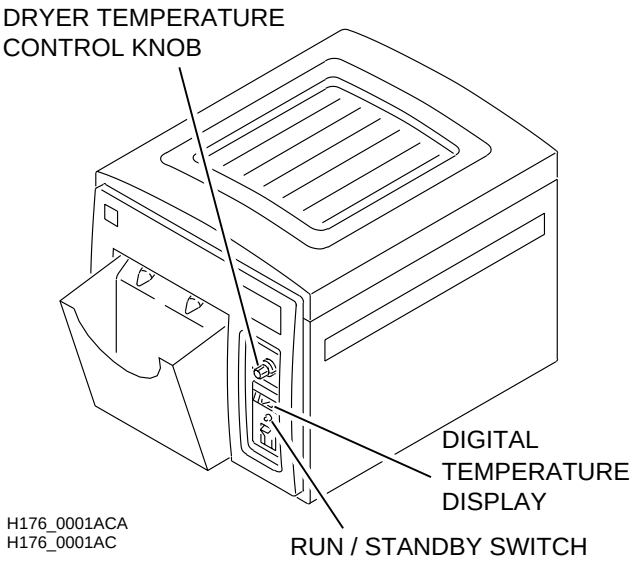
- water is flowing from the Water Inlet Tube of the Wash Tank
- 2 Evaporation Covers are installed

[7] Install the Top Cover.

Warning

Dangerous Voltage

[8] Energize the Processor.



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[9] Wait until the Digital Temperature Display displays the correct temperature of the developer solution:

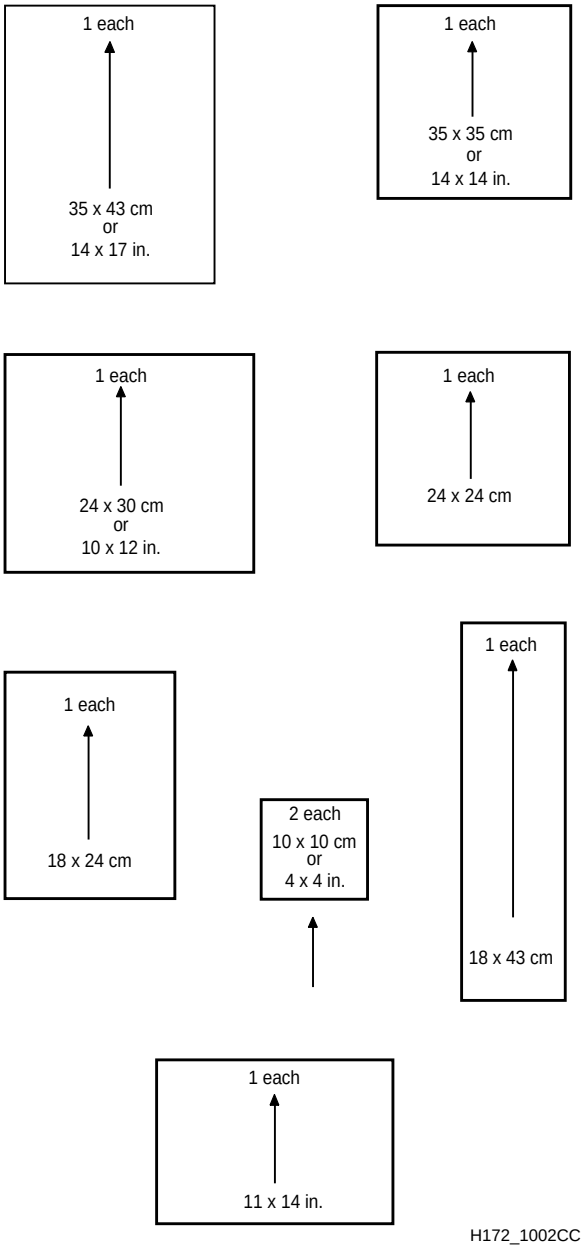
Cycle	Temperature
Standard	33.3 ± 0.3°C (92.0 ± 0.5°F)
Rapid	34.4 ± 0.3°C (94.0 ± 0.5°F)

[10] Press the Run/Standby Switch.

[11] Feed a sheet of *Kodak* Roller Transport Cleanup Film into the Processor.

[12] Adjust the Dryer Temperature Control Knob to the lowest possible temperature that will still allow the film to dry.

Feeding Sheet Film



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[1] Press the Run/Standby Switch. The Motors will begin to operate.

Important

- Feed Mammography film with the emulsion side **down.**
- Feed General Radiography film with the emulsion side **up.**
- A film feed signal will sound when it is safe to feed another sheet of film.

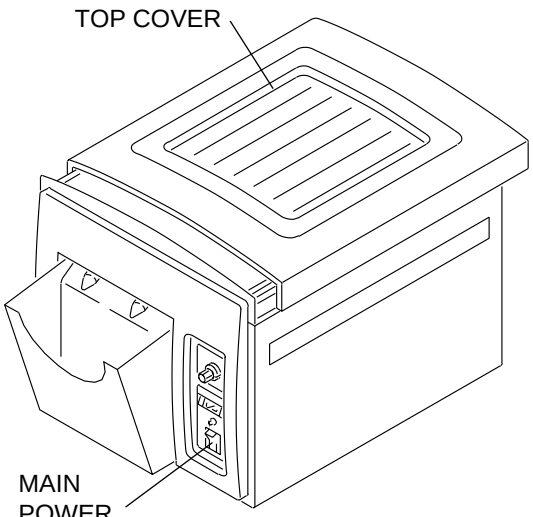
[2] Check that the developer solution is at the correct temperature. See the table on Page 8, Step 9.

[3] Feed a sheet of film into the Processor.

Note

The Processor will automatically return to the “Standby” mode after the last film exits the Processor.

Shutdown



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[1] Turn off:

- Main Power Switch
- water supply

Warning

Dangerous Voltage

[2] Disconnect the main power.

[3] Do the “Daily Procedure” on Page 18.

[4] Install the Top Cover with a 5 cm (2 in.) opening for venting purposes.

Note

The optimum time to do daily cleaning is at shutdown.

Section 4: Processing Solutions

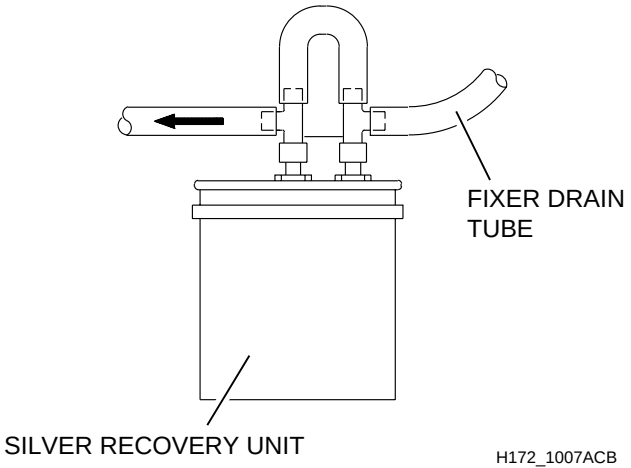
Preparing the Solutions

Warning

- Use eye protection and rubber gloves.
- Wash the mixing equipment thoroughly between solutions to prevent contamination of the processing solutions.
- Do not mix more than a 2-week supply of chemicals.

[1] Mix the volume of processing solution required. Use the instructions packed with the chemicals.

Draining the Tanks



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Warning
Dangerous Voltage

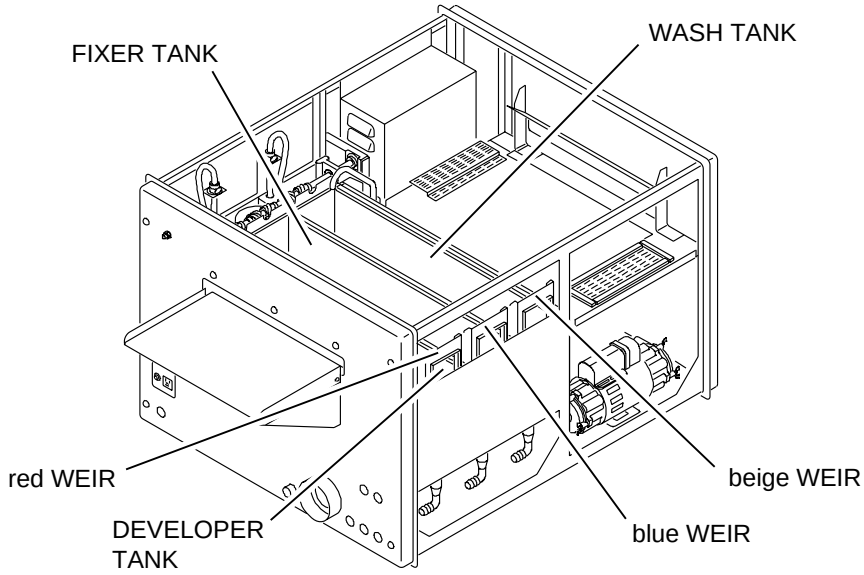
[1] De-energize and disconnect the main power.

Warning
Use eye protection and rubber gloves.

[2] Remove the Top Cover.

[3] If the Processor has a Silver Recovery Unit connected, disconnect the Fixer Drain Tube at the input side of the Silver Recovery Unit.

[4] Place the Fixer Drain Tube in the Floor Drain or a compatible collection container. Check the local codes for the correct collection procedures.



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Caution

Drain only 1 Tank at a time.

Check the local codes for the correct collection procedures.

Do not interchange the Weirs:

Weir	Tank
red	Developer
blue	Fixer
beige	Wash

[5] Remove the blue Weir.

[6] Drain the Fixer Tank.

[7] Install the blue Weir.

[8] Remove the red Weir.

[9] Drain the Developer Tank.

[10] Install the red Weir.

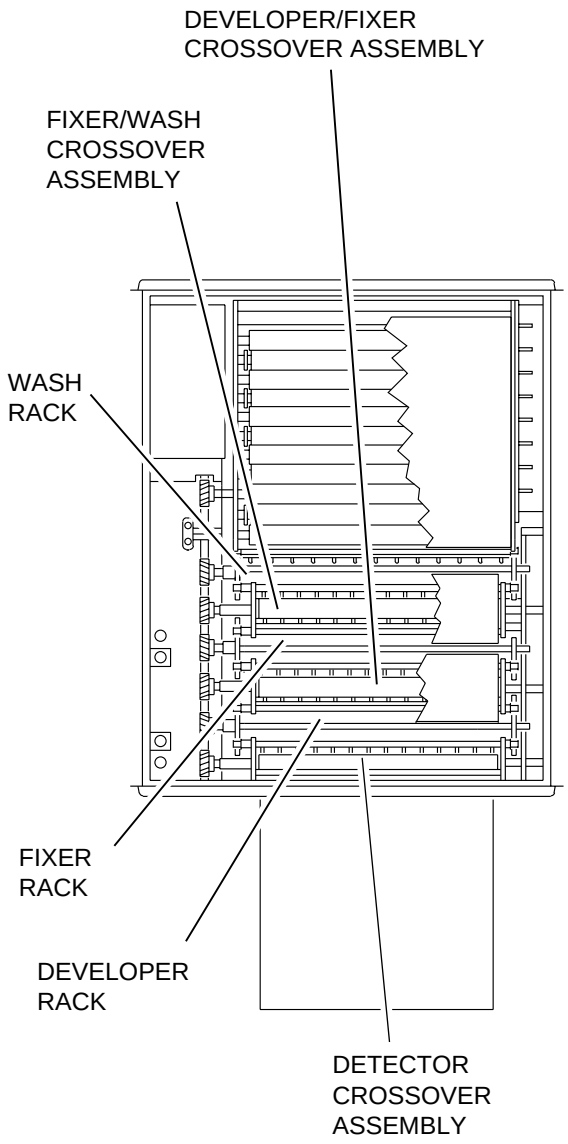
[11] Remove the beige Weir.

[12] Drain the Wash Tank.

[13] Install:

- beige Weir
- Top Cover

Filling the Tanks



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Warning

Dangerous Voltage

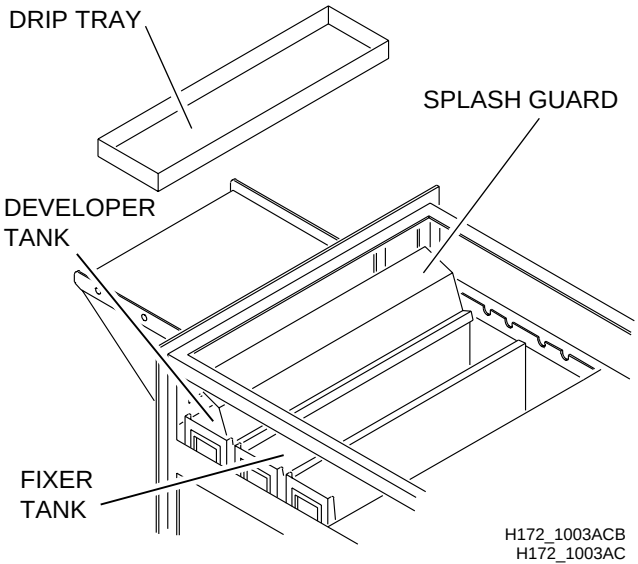
[1] De-energize and disconnect the main power.

Warning

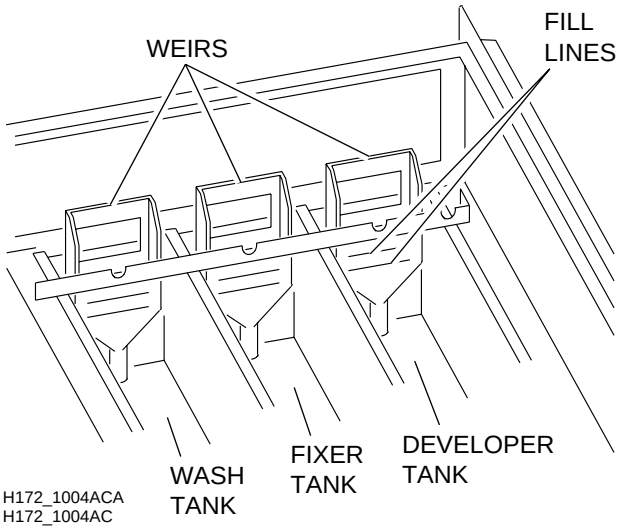
Use eye protection and rubber gloves.

[2] Remove the Top Cover.

[3] Carefully and slowly remove the correct Crossover Assembly and Rack from the Tank that is to be filled.



[4] Install the Splash Guard between the Developer Tank and the Fixer Tank.



Caution

- Small amounts of fixer will cause excessive developer contamination.
- Use the Drip Tray.
- If solutions are changed in both Tanks, fill **the Fixer Tank first** so any solution that spills into the Developer Tank can be completely cleaned.

[5] To fill the Fixer Tank, add fixer replenisher until the solution is at the **higher** Fill Line on the blue Weir.

[6] Remove and rinse the Splash Guard.

[7] Install the Splash Guard over the Fixer Tank.

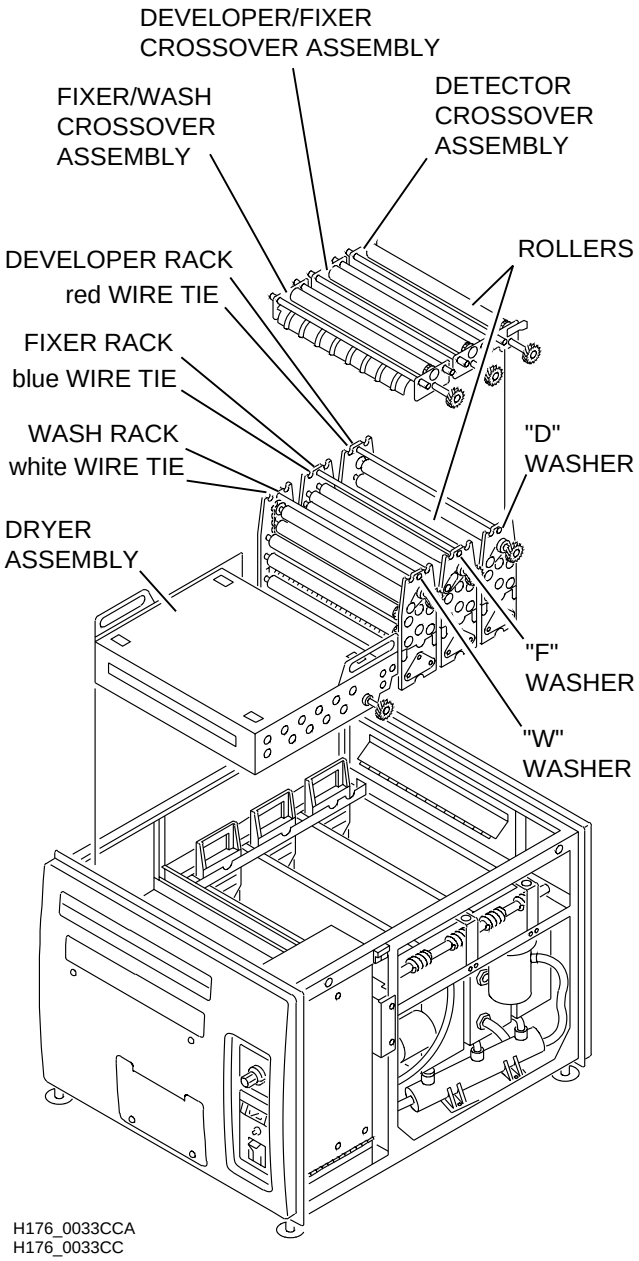
[8] To fill the Developer Tank:

(a) Fill the Developer Tank **half full** of developer replenisher from the Replenisher Tank.

(b) Add the *Kodak* RP *X-Omat* Developer Starter:

- for Mammography, 380 mL (13 fl oz)
- for General Radiography, 190 mL (6.5 fl oz)

(c) Fill the Developer Tank to the **lower** Fill Line on the red Weir with developer replenisher.



Caution

- Prevent contamination and spills.
- The Racks are identified with a letter on the Washer and a color on the Wire Tie:

  “D” for the Developer Rack - red

  “F” for the Fixer Rack - blue

  “W” for the Wash Rack - white

[9] Slowly and carefully install the Racks. Use:

- Drip Tray
- Splash Guard

[10] Remove the Splash Guard and rinse thoroughly with water.

[11] Install:

- Crossover Assemblies
- 2 Evaporation Covers
- Dryer Assembly, if removed

[12] Check that the developer solution is at the correct temperature. See the table on Page 8, Step 9.

[13] Install the Top Cover.

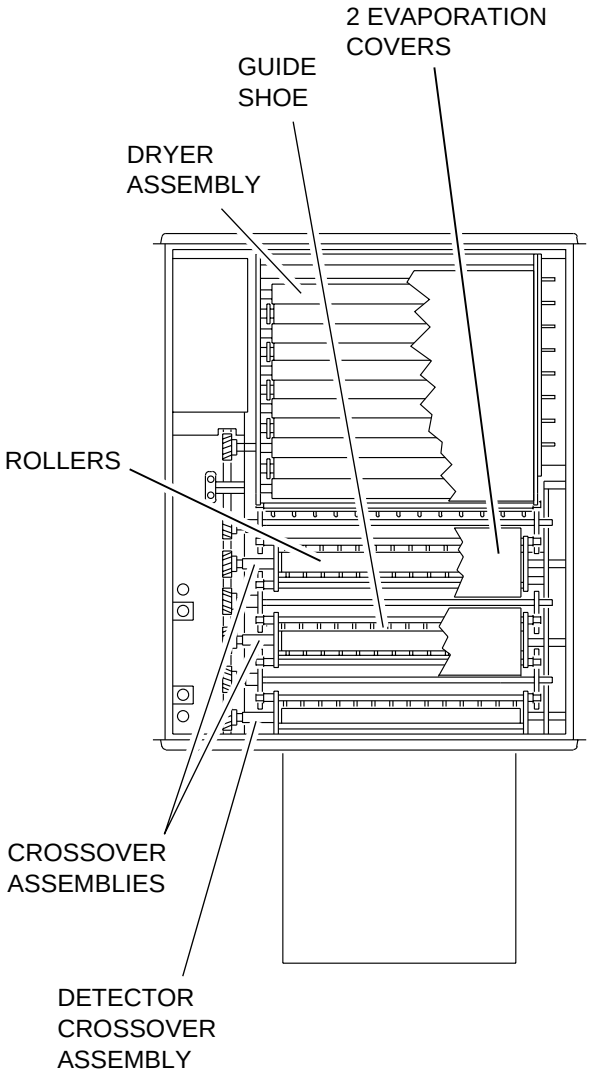
Section 5: Correcting Difficulties

1	2	3	4	5	6	
						1. Transport Failure
						2. Surface Artifacts
						3. Abnormal Film Densities
						4. Wet Films
						5. Low Solution Levels
						6. Overlapping of Films
•					•	Film Feeding Error Feed only single thicknesses of film. Feed the next film only after the film feed signal sounds If there is no film feed signal, refer the difficulty to qualified service personnel.
•	•	•	•			Feed only compatible films.
•					•	Check that all Racks and Crossovers are seated correctly.
•	•					Check that the surfaces of all the Rollers are clean and smooth, especially in the Developer Turnaround Assembly.
•			•			Check that the Dryer Air Tubes are in the correct positions.
	•		•			Remove any dirt from the Dryer Rollers and Air Tubes from the Dryer Assembly, especially the slots. Use a bottle brush and rinse with water.
	•	•	•	•		Check that the replenishment rates are correct.
	•					Adjust the Dryer temperature control setting to the **lowest** possible temperature that still allows good drying.
	•					Clean the Feed Shelf and Detector Rollers.
•	•				•	Clean any biological growth in the Wash Tank with a mild solution of chlorine bleach. Use 60 mL (2 fl oz) of bleach per 3.8 L (1 gallon) of water. Wipe the Tanks with a soft sponge.
•				•		Check that the Weirs are seated correctly. Check that the Tanks are full.
•	•	•	•		•	Change any chemicals that were not mixed correctly, are exhausted, or are contaminated. Check that the replenishment flow rates are correctly set. Fill the Replenishment Tanks if necessary.
•	•				•	Check that <u>all</u> Rollers are in place and positioned and rotating correctly.
•	•				•	Check that <u>all</u> Roller Gears, Sprockets, and Idlers are engaged.
•	•				•	Replace any Roller that has a broken or worn Gudgeons.
•	•				•	Replace any Bearings that do not allow the Turnaround Rollers to rotate correctly.
•	•					Check the tension on the Rack Chain. Check that the Rollers do not hesitate and that the Chain moves smoothly.
		•				With the Processor on, check for movement on the surface of the solutions. Movement indicates recirculation.
•	•					If the incoming wash water is dirty, clean the Rack and Tank thoroughly. Change the incoming Water Filter. Use the correct Water Filter.
			•			Check that the Dryer Air Exhaust is free from any obstruction.
•					•	Check that the Turnaround Assembly is adjusted correctly. The Turnaround Assemblies must be square with the Racks.
	•	•				Check the incoming water temperature. Temperature must be between 4.4×°C (40°F) and 29.4°C (85°F).

1. Transport Failure						
	2. Surface Artifacts					
		3. Abnormal Film Densities				
			4. Wet Films			
				5. Low Solution Levels		
					6. Overlapping of Films	
1	**2**	**3**	**4**	**5**	**6**	
		•				Check that the correct Bulb and Safelight Filter are in the Safelight and at the correct distance from the Feed Shelf and work surface.
•		•				Check that the Top Cover is tight on the Processor. Check that there are no leaks in the Light Lock Gasket.
•						10 x 10 cm films - feed films diagonally if they fail to transport reliably.
					•	For all transport speeds, the buzzer should sound once the trailing edge of the film has advanced 75 mm (3 in.) into the Processor.
•	•	•			•	Check that the Tank solution levels are at the overflow Weirs.
				•		Check for solution in the Replenishment Tanks. Fill if necessary. NOTE: Mix developer replenisher in quantities not to exceed a 2-week supply.
		•				With a reliable thermometer, check that the temperature of the developer is correct. If necessary, have qualified service personnel make adjustments. NOTE: Check the incoming water temperature. It must be a minimum of 4×°C (7°×F) lower than the desired developer temperature.

Section 6: Cleaning and Periodic Maintenance

Daily Procedure



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Important

The optimum time to do daily cleaning is at shutdown.

[1] Identify any change in the operating condition of the Processor to service personnel.

Warning

Dangerous Voltage

[2] De-energize the Processor. Disconnect the main power.

[3] Turn off the water supply.

Warning

Use eye protection, rubber gloves, and protective clothing before doing any maintenance procedures.

[4] Remove the Top Cover.

Caution

Do not touch or move the Guide Shoes.

[5] Remove and rinse with warm water:

- 2 Evaporation Covers
- Crossover Assemblies

[6] Rotate and clean the Rollers with a **soft** brush and warm water.

[7] Use a cloth or synthetic sponge to remove any water from the Rollers or allow to air dry.

[8] Remove all chemical deposits above the solution level in the processing section.

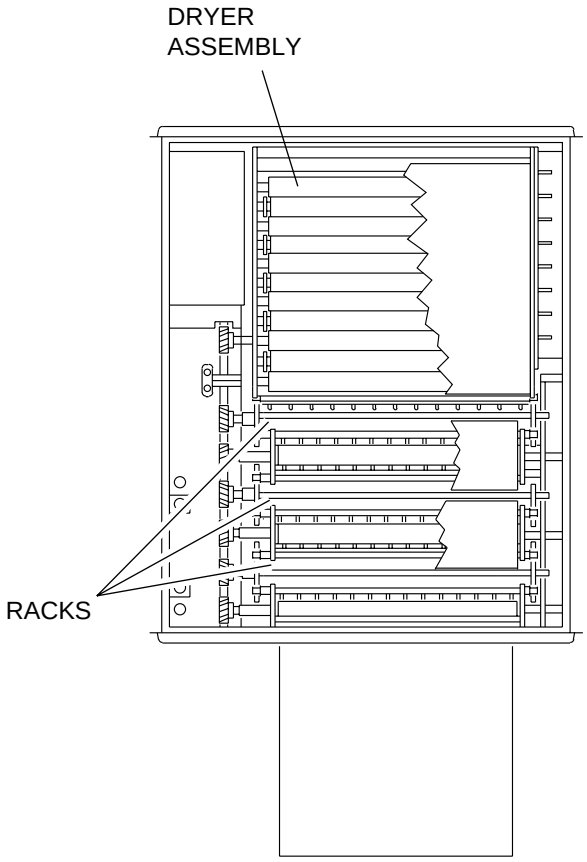
[9] Clean off debris or buildup from the dryer area with a warm, damp sponge or cloth.

[10] Install:

- Crossover Assemblies
- 2 Evaporation Covers

[11] At shutdown for venting purposes, install the Top Cover with a 5 cm (2 in.) gap.

Every Two Weeks



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[1] Do Step 2 - Step 8 of the “Daily Procedure” on Page 18.

[2] Remove the Dryer Assembly.

[3] Clean off debris from the dryer area and Dryer Assembly with a warm, damp sponge or cloth.

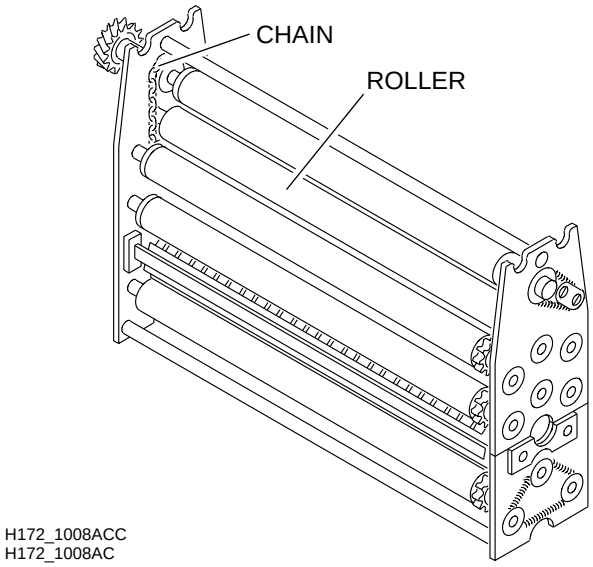
Caution

- Avoid contamination of the processing solutions.
- Use the Drip Tray when moving Racks to or from the Processor.

[4] Remove the Racks.

[5] Install the Splash Guard between the Developer Tank and the Fixer Tank. See Page 14, Step 4.

[6] Rinse the Racks and wipe them with a clean soft cloth.



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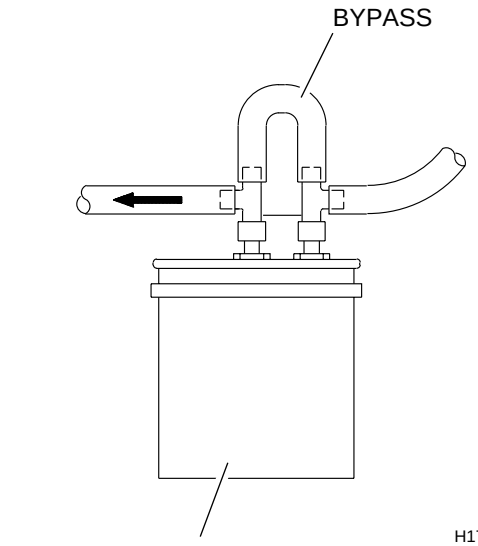
[7] Check:

- Chains move freely
- Rollers rotate smoothly

[8] Install:

- Racks
- Dryer Assembly
- Top Cover



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[9] To check the operation of the Silver Recovery Unit if installed:

(a) Check that no solution is flowing through the Bypass.

(b) If solution is present in the Bypass, the Silver Recovery Unit is not operating. Make a call to service personnel.

(c) Use the *Kodak* Silver Estimating Test Papers, Catalog No. 196 5466, to check the silver content of the solution flowing into the drain.

(d) If the test results indicate more than 1 gram/liter of silver, a new Silver Recovery Unit must be installed. Make a call to service personnel.

Section 7: New Equipment Warranty

Warranty Coverage

Kodak warrants the Processors to function properly for 1 year from the date of initial installation, when installed within one year from the date of shipment.

If the equipment does not function correctly during the warranty period, the dealer that sold the equipment will provide or arrange for repair of the equipment during the dealer's normal working hours. Such repair service will include any necessary adjustments and/or replacement of parts necessary to maintain your equipment in good working order.

How to Obtain Service

Should equipment require service, see the sales contract for details on whom to call for service, or contact the dealer that sold you the equipment.

Limitations

- Warranty service is limited to the contiguous United States, the island of Oahu in Hawaii, and certain areas of Alaska.
- This warranty does not cover circumstances beyond Kodak's control, misuse, or abuse. Any attachments, accessories, or alterations not marketed by Kodak (including service or parts to correct problems resulting from the use of such attachments, accessories or alterations), failure to follow Kodak's operating instructions, or supply items.
- Kodak makes no other warranties, express, implied, or of merchantability for this equipment.
- Repair without charge is Kodak's and the dealer's only obligation under this warranty.
  - **Kodak will not be responsible for any consequential or incidental damages resulting from the sale, use, or improper functioning of this equipment even if loss or damage is caused by the negligence or other fault of Kodak.**
  - Such damages for which Kodak will not be responsible, include, but are not limited to, loss of revenue or profit, downtime costs, loss of use of the equipment, cost of any substitute equipment, facilities or services or claims of your customers for such damages.
- This limitation of liability will not apply to claims for injury to persons or damage to property caused by the sole negligence or fault of Kodak or by persons under its direction or control.

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Rochester, NY 14650

HEALTH IMAGING